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LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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FOR STATE NAVAL RESERVES.

In connection with the strong presentation by Secretary Herbert of the necessity for the procurement of a number of new torpedo boats, a proposition has been made to him whereby the navy may be made very popular in the vast interior of the United States, where it is now almost unknown, and, more important still, the navy may hold at its disposal a large force of trained sailors, peculiarly expert in the torpedo service, which there is now no adequate opportunity to develop. The plan in brief is for the government to build a large number of torpedo boats and to lend them to the states' naval militia to be used at any point on lakes or rivers. Competent engineers and ordinary officers would be detailed to instruct the state naval reserves in the use of these boats and the men would be free too avail of them for drill performing every office on the boat themselves, steering, firing, and running the engines. It has already been established that the smaller torpedo boats can be moved from point to point quickly by rail, so that in case of war a great number of these indispensable craft could be concentrated at any threatened point on our coast, all manned by crews thoroughly familiar with their boats and expert in the torpedo drill, constituting an adjunct of almost inestimable value. One of the strongest features of the plan, which, of course, would require congressional sanction, is that owing to cheapness of the small torpedo boats as compared with a full-sized warship, a very moderate appropriation, not more than would be required to build one battleship, would procure fifty of the torpedo boats.

AIDS TO NAVIGATION.

The secretary of the treasury has sent to congress estimates of appropriations required for the light-house service and river and harbor improvements for the fiscal year ending June 30, 1896.

The recommendations this year are more liberal than in many previous years though the question of appropriations is another matter. But even this better outlook has been accomplished largely by the active and earnest co-operation of vessel owners and district officers in unanimously recommending more liberal appropriations in order to facilitate lake commerce. The recommendation by the committee concerning Lake Ontario which were adopted by the light-house board are as follows:

LAKE ONTARIO.

For a light station off Carlton Island, Lake Ontario, New York, $8,600; light and fog station at Fort Wadsworth, N. Y., moving from Fort Tompkins, $1,500; Galloo Island fog signal, Lake Ontario, $5,700; Oswego breakwater fog signal, Lake Ontario, N. Y., $4,300; Tibbetts Point fog signal, Lake Ontario, N. Y., $4,300; Wilson Harbor light station, Lake Ontario, N. Y., $2,500.

ESTIMATES FOR LAKE ERIE.

Establishing a new site, a keeper's dwelling and storehouse at Cleveland, $25,000. The Cleveland main light with keeper's dwelling annexed on the hill is no longer needed. It is proposed to sell the real estate and erect a dwelling and store on a sight in the harbor to be selected for that purpose. Conneaut range lights, constructing a beacon light at end of pier and another near the shore, the two to be connected by an elevated walk on the west pier, $2,500. Maumee Bay range, establishing new beacon at each end of range and keeper's dwelling to form a range both outward and inward in the line of the channel in Maumee Bay, $25,000.

The following marked "necessary:" Lighthouse and buoy depot, Erie, Pa. Removing same from Buffalo and establishing at Erie, $35,000.

The "desirable" items are as follows: Black River or Lorain station, establishing a fog signal, $4,300, Fairport harbor fog signal to replace inefficient bell, $4,700; Port Clinton re-establishing light station, $1,500. The light is necessary to eight or ten fishing tugs belonging to this port.

Estimates for harbor improvements are as follows: Ashtabula, (contemplated) $180,000; completing improvement at the mouth of the Black River, $36,000; continuing improvement at Cleveland, $200,000; continuing at Conneaut, $200,000; continuing at Fairport; $100,000; continuing at Huron, $50,000; completing at Port Clinton, $21,000; continuing at Sandusky, $100,000; continuing at Toledo, $300,000; completing repairs at Vermillion, $4,000.

Strong efforts will be made at the coming session of congress by members from states bordering on the great lakes to secure the passage of the recommendations made by the war department and the light house board.

ESTIMATES FOR WISCONSIN.—The secretary of the treasury's estimates for continuing work on rivers and harbors in Wisconsin, and for other matters during the fiscal year ending June 30, 1896, were as follows: purchasing site and building keepers' dwelling at Kewaunee light station, $7,000; Manitowoc light station fog whistle, $5,500; Sturgeon Bay canal light station, establishing light station at entrance to canal, $20,000; rebuilding main La Pointe light tower, $10,000; constructing tower at Devil's Island light, $22,000; constructing a crib at Tail Point light station, $7,500; establishing light at Peshtigo, $10,000; establishing fog signal at Sheboygan pierhead, $5,500; establishing a light station at Bayfield, $5,000; establishing a light station at the north pier at South Milwaukee, $7,500; for improving Sturgeon Bay and Lake Michigan ship canal, $78,450; St. Croix River, continuing improvement, $142,000; harbor at Kenosha, $54,000; Green Bay, $46,915; Ashland, $143,500; Annapee, $15,000; maintenance and repairs at Milwaukee, $20,000; completing improvement on harbor of refuge at Milwaukee Bay, $188,738; improving harbor at Superior Bay, St. Louis Bay, $156,736; harbor at Two Rivers, $18,800; light at Chequamegon Point, $10,000.

ESTIMATES FOR MICHIGAN.—Establishing a supply and buoy depot at Scammond harbor, Lake Huron, Mich., or at or near such point near the Straits of Mackinac as the lighthouse board may select, $15,000; lighthouse and fog signal at Point Aux Barques, Lake Michigan, $32,000; light and fog signal at north end of North Manitou island, Lake Michigan, $20,000; range lights and steam signal at Plum island, Death's door, Lake Michigan, $21,000; fog signal at South Fox island, Lake Michigan, $5,500; range lights, station and dwelling for keeper at Grassy island, Detroit River, $10,000; range light at south end of Grassy island, $700; light keeper's dwelling at Gross Isle, $5,000; additional land for the Cheboygan River front range light station, Straits of Mackinac, $1,750; paving in front of light depot at Detroit, $2,000; range lights at Grosse point, Detroit River, $8,260; steam fog signal at Big Sauble light station, Michigan, $5.500; steam fog signal at Eagle harbor light station, $5,500; light and fog signal at Grand Marais, $15,000; establishing electric communication with light vessels, $50,000; light and station at Little Gull island, $20,000; range lights on Menasha River, $500; additional land at lighthouse at old Mackinac point, $1,000; steam fog signal at St. Joseph's harbor, Mich., $5,000; light and fog signal station at St. Martin island, Green Bay, Mich., $15,000; moving light from Eagle River to Sand Hills, Mich., $20,000; light and fog signal station at Hat point, Lake Superior, $15,000; Poe's reef light ship in Straits of Mackinac, $25,000.

NEWS AROUND THE LAKES.

CHICAGO, ILL.

Special Correspondence to The Marine Record.

J. J. Rardon & Co. chartered the steamers Hesper and Gladstone for corn to Buffalo at 3 cents.

Carr & Blair chartered the steamers W. F. Sauber and Simon Langell for corn to Port Huron at 3 cents.

The Chicago Ship Building Co. dry docked two vessels last week in their large new dock, which is now all ready for business.

Elphicke & Co. chartered the steamer Byron W. Whittaker for corn to Port Huron at 3 cents; the steamer C. W. Elphicke for corn to Buffalo.

The barge Peshtigo, Captain Pollock left here Saturday in tow of the tug Boynton, bound for Port Huron where she is to receive a thorough rebuild this winter.

The life saving crew at South Chicago were paid off for the season on Wednesday and the station was closed for the winter. The Chicago crew will be paid off December 15.

The damage sustained by the schooner A. Mosher by collision with the steamer J. C. Perritt is as follows: 9 strakes of outside plank, 5 strakes and shelf piece inside and main rail and an outside finger broken.

Captain John Prindirville chartered the steamer Pontiac for barley to Buffalo at 3 cents, the steamer Sitka for corn to Buffalo at 3 cents, the steamer H. A. Tuttle for oats, Green Bay to Buffalo at 3 cents.

The steamer Rube Richards was in dry dock for fixing sternbearing, some new plank on bottom and leak stopping, the tug Robbie Dunham for ironing, the steamer Egyptian and Albert Soper for repairs to stern bearing.

One of the late navigators is Capt. Olaf Anderson, who intends to keep his steamer, the Colin Campbell, carrying lumber from Ludington to this port until the lake freezes over solid. The freight out of Ludington now is $1.50.

The Dunham Towing and Wrecking Co. have contracted with the Chicago city authorities to do the winter work at the water work cribs. The company are to receive $590 per month for the use of two tugs and $2.45 per hour for extra work done by other tugs.

Charters were made last week here at 1½ and 2 cents on corn to Buffalo, 4½ cents to Ogdensburg, to Port Huron 1½ cents; oats 1⅜ cents on consort, Erie 1½ cents, Milwaukee ¾ cent on wheat free of handling; pig iron Manistique to Buffalo, $1.25 free of handling.

Captain Duncan Buchanan of the schooner Seaman wishes to thank the captain and crew of the Life Saving Station at Kewaunee, Wis., through the columns of THE MARINE RECORD for services rendered on board his schooner on two occasions, when entering Kewaunee in the month of November during rough weather.

Capt. Isaac D. Stedman died December 2nd at his late residence No. 280 Forquer street, Chicago. The deceased retired from sailing several years ago. The last schooner he was master of was the Minerva which he sailed for many years. He was buried at Graceland Cemetery on the afternoon of the 4th Dec. by Cleveland Lodge A. F. and A. M. of which he was a member.

United States Engineer Wickham has been busy the last week at St. Joseph, Mich., preparing for the extensive repairs which will be made on the piers at that harbor. One of the largest portions will be the re-construction of 100 feet of the north pier, washed out by the storm of a year ago, and which allowed the sand to run in and form a bar 500 feet long between the piers.

Wiley M. Egan chartered the steamer Neshoto for 85,000 bushels of corn to Buffalo at 3 cents, the steamer City of Genoa for 100,000 bushels of corn to Buffalo at 3 cents, the steamer R. E. Schuck for 85,000 bushels of corn to Buffalo at 3 cents, the steamer Columbia for 65,000 bushels of corn to Port Huron at 3 cents, the steamer Louisiana for 12,000 bushels of oats to Buffalo port.

The Vulcan Iron Works are building the operating machinery for the Metropolitan elevated railroad's folding bridge, crossing Chicago River near Van Buren street. All the gearing, of which there is 150 tons, is made of cast steel, and the shafting is of open hearth steel of the highest grade. This contract and some smaller ones has kept their works busy for the past six months, They report the business outlook as being excellent.

The schooner City of Grand Rapids arrived at this port Saturday night. Capt. C. Anderson reports that the schooner left Ford River with lumber for Chicago on the 23rd November and went ashore one mile north of Jacksonport same day. After lightening about 50,000 feet of her cargo, she was released and towed to Spurgeon Bay. As her shoe and rudder were gone it was found necessary to have her towed to Chicago. The schooner was uninsured.

George Warrington is building a steel steam yacht for H. F. Batch, of Chicago. Her dimensions are 130 feet over all, 110 feet on water line, 16 feet beam, 10 feet 6 inches depth of hold, engine triple expansion 12, 19 and 32 by 18. Two Warrington water tube boilers each having 35 feet grate surface, wheel 6 feet 6 inches in diameter. She will be for service on the lakes and the Atlantic ocean and will be splendidly fitted and furnished. Her estimated cost is $75,000. The firm are also building a No. 20 Warrington water tube boiler for the steam yacht Laura S., owned by M. J. Steffens, of this port.

Henry B. Burger of the firm of H. B. & G. B. Burger shipbuilders, was in Chicago, Friday, on business. At their shipyard the barge David Wallace is in dry dock receiving a new keel and about one-fourth new bottom plank. The barge Manitowoc was in dock and received 40 feet of new starboard side comprising new outside plank and ceiling and several new frames. The tug Agitator was on the boxes for a new rudder and shoe, the schooner Naiad for bottom calking, the tug West for ironing and repairs to stern bearing, the tug George Pankratz for a new stern bearing. The firm have considerable work ahead for the winter.

The Chicago lodge of the Shipmasters' Association held the first meeting for the season on Wednesday. About forty members were present and the meeting was an enthusiastic one. Out of the membership of eighty-eight, only two had died during the year, Capts. Pardee and Sargisson. In both cases the treasurer reported the full amount of their life insurance had been paid to the heirs. The members decided to have a grand reunion of the members and their wives some time during the winter, and Capt. David Cochrane was appointed the chairman of a committee to take charge of this matter. The annual election of officers takes place the last meeting of the month and the installation the first meeting in January. The annual meeting of the grand lodge will be held in Detroit, at the Russell House, the second Tuesday in January.

The Chicago Board of Marine Underwriters Saturday afternoon fixed the following insurance rates on grain for storage during the winter and the voyage to its destination at the opening of navigation next spring: To ports on Lake Michigan, Lake Huron, Sarnia, and Detroit River, 1 per cent; Georgian Bay and Lake Erie, 1 1-10; Lake Ontario and Ogdensburg, 1 2-10; Montreal, 1¼. The general insurance agents decided not to reduce their trip rates on grain down this fall below 1½ per cent, as agreed upon Friday, Toledo and Detroit being 60 per cent of the foregoing. The difficulty with trip rates so late in the season is that the insurance companies, which reinsure portions of the risk, are adverse to taking large lines at this season of the year, and the companies ordinarily engaged in marine insurance are compelled to offer extraordinary inducements in order to obtain reinsurance.

DETROIT, MICH.

Special Correspondence to The Marine Record.

According to present orders the steamer Iroquois will winter at this port.

Capt. Bassett, of the steamer Manola, expects to have his steamer laid up and to be home at the end of this week.

Mr. A. Stevenson Smith, marine secretary of the Sun Insurance Co., of San Francisco, is making a business trip through the lake ports.

Capt. Watts having resigned command of the steamer Ranney, reached here this week and will remain home until navigation opens again.

The underwriters' meeting to arrange for the inspection of vessels to be used for the winter storage of grain, adjourned until December 11, when this and other matters requiring attention will be taken up.

Capt. John J. Read, U. S. N., who succeeded Commander Heyerman as inspector of the eleventh light-house district, and who has for some months been in command of the receiving ship Independence, has been ordered to the command of the new protected cruiser Olympia.

The steamer City of Sandusky will be dismantled at this port. The master, engineer and clerk have been in the boat for fourteen seasons. On the opening of navigation next year the Sandusky's route on Lake Erie will be taken up by the new steamer now building at the yards of the Detroit Dry Dock Co.

Mr. E. E. Roberts, of the Roberts Safety Water Tube Boiler Co., New York, has been staying at the Wayne Hotel for a few days and will continue his western business tour after closing up contracts at this port. The Roberts water tube boiler is well known throughout the United States; it has long passed the initial stage and its merits are beyond cavil. Mr. Roberts seemed no ways inclined to speak of the contracts he had closed and intended to figure on during his trip, but I expect to learn of several orders being placed when he returns to this port heading east.

F. W. Wheeler is quoted as saying that negotiations which were pending with his company for the construction of four steel barges for use on the Atlantic coast, and which he expected to secure the contract for, are at a standstill, owing to President Cleveland's statement at the launching of the battleship St. Louis, that he intended to urge the passage of the "free ship bill" at the coming session of congress. The projectors of the line think that if the bill passes they can buy in England much cheaper than they can here and have determined to await the action of congress before ordering.

Speaking of wreck raising devices and appliances, diver James E. Quinn says: "The Collins Bay Rafting & Towing Co. have cigar shaped steel pontoons, the invention of Mr. Leslie, that I think is a better one than any other. When the City of Owen Sound was sunk in Georgian Bay, one of these pontoons was made fast to each side of her, and when the water was forced out of them and air forced in, they lifted her to the surface without a stop, and she was down deep. That is the beauty of this device, and as it is all under water the gale or gales that stop wrecking operations cannot injure it."

On Wednesday evening last Mr. David Carter gave his annual dinner to the employes of the line. When the last course had been disposed of, Mr. Schantz arose. He said he had an important duty to perform. It was a pleasure as well as a duty, for it demonstrated the high esteem in which Mr. Carter was held by those assembled. With this and a few other well chosen and happily expressed remarks, the speaker drew forth a magnificent gold-headed cane from beneath his coat and flashed it before Mr. Carter's eyes, with the announcement that it was his because his employes gave it to him, and—"God bless you, Mr. Carter," concluded the speaker. The recipient was much affected and thanked his employes with great feeling. This annual has been a feature of the D. & C. Line for many years and has served to keep the management in close touch with all the employes.

BUFFALO, N. Y.

Special Correspondence to The Marine Record.

The cargo hanlding record made on the Tuscarora here last week is in advance of all previous figures. The work showed 2,500 tons of general cargo discharged and 2,000 tons loaded in the space of eleven hours.

The insurance agents are doing their best to put as liberal a construction on the hull extension rule as possible and it is agreed that first-class steamers, especially if constructed of steel, may have their insurance renewed as late as December 10 at noon if actually sailing.

Mr. John Gordon, general manager of the Northern Steamship Co. announces that Mr. Duncan Fraser has been appointed superintending engineer of the Northern Line, vice A. Mac Adams resigned. The new appointment became effective December 1 and Mr. Fraser's office will be at 60 Main street.

The schooner Ida Keith is moored in the Ohio Basin. It is not believed she is worth repairing. As a constructive total loss the insurance companies will pay the full amount of her policy. The Keith went broadside on the waterworks pier and was so badly damaged that it would cost more to repair her than she is worth.

The steamer Ranney was ashore at the mouth of the Kamanistique river for six days and six hours after loading grain at Fort William. She was not leaking on her arrival here as the bottom of the river is soft, but it is a sad reflection on that Canadian port that no adequ-

ate assistance could be procured to get the steamer afloat in less time than a week and then only by the efforts of steamers belonging to the same line.

It was thought a little whlle ago that as the Northern Steamship Co. had chartered the new steel steamer Globe that they would likely purchase her at the end of the season. Whether the Northern Line is not ready to increase its fleet just yet or the Globe is held at too high a price, or for some other reason, the latest built Cleveland steamer is not to be enrolled in the Northern fleet, although it is admitted on all sides that she is the peer of anything in the freight carrying line afloat on the lakes.

On Sunday morning the Lehigh Valley Line steamer Seneca wanted to see if the shoal named after her near this port was still in existence, thinking that perhaps the Alva had ground it down when she was on there a few days ago. The Seneca found the Seneca Shoal all right and remained there until assisted off. This shoal was found about two years ago by the Seneca at a cost of about $15,000 for assistance and repairs to the vessel though it is not thought that her four hours' rest there this week resulted in any but minor damage.

GRAND HAVEN, MICH.

Special Correspondence to The Marine Record.

The following crafts have gone into winter quarters here: Steamers Pentland, Mary H. Boyce, Alice M. Gill, Mary A. McGregor, T. S. Faxton, Charles West, Fanny M. Rose, Nellie, Joe, Sport, also a fleet of tugs; schooners, Robert Howlett, David Macy, Stevenson, Lena Behm, Alert, Condor, the Grand Haven & Milwaukee sidewheeler, City of Milwaukee went into winter quarters here Saturday and the steamers Wisconsin and Osceola will go on the winter line.

CLEVELAND, O.

Special Correspondence to The Marine Record.

The Maritana followed the steel steamer Briton in the Cleveland dry dock.

The steamers J. H. Wade, Wm. Chisholm and J. H. Devereux will winter at this port.

Capt. John Donahue has been placed in command of the steamer Ranney, vice Capt. Watts, resigned.

Capt. F. D. Herriman and Mr. Watterson surveyed the damages on the steamer V. H. Ketchum this week.

The employes of the V. O. T. Co. will give their annual ball at Army and Navy Hall, on Thursday, December 20.

The Cleveland Ship Building Co. finished repairs during the week on the steel steamers Wawatam, La Salle, Alva and Mesaba.

The steel steamer Briton, of the Menominee Line, followed the Corsica in the Cleveland dry dock, this week, for bottom repairs.

Capt. Thomas Wilson has been in New York this week, attending a meeting of the directors of the Columbian Whaleback Co.

Capt. Watts, this season in the Bradley employ, spent Monday at this port visiting his marine acquaintances. He left in the evening for his home in Detroit.

The I. W. Nicholas was chartered this week for corn, Toledo to Buffalo at 2 cents per bushel, several other charters were made on the same terms.

The steamer V. H. Ketchum arrived here all well and was docked in the Ship Owners' Dry Dock for survey. Repairs will be executed at this port during the winter.

Photographs have been taken of the interior of the branch hydrographic office at this port, showing the arrangement of the several instruments with which the office is installed.

C. R. Jones & Co., vessel owners and brokers, have moved their offices in the Perry-Payne building to room 522. A. M. Jones & Co., underwriters' agents, have also located in the same suite.

The past week has been a very busy one at the Ship Owners' Dry Dock. The large steel steemers Wawatam, La Salle, Maruba and Mariska have each docked there for overhauling and repairs.

Mr. Robert Logan has been appointed superintendent of construction for the Northern Steamship Co., and is now attending the building of the North Land at the yards of the Globe Iron Works Co.

Assistant General Manager Fred P. Gordon, of the Northern Steamship Co., visited this port on Tuesday and inspected the work in progress on the North Land, at the yards of the Globe Iron Works Co.

The new steamer contracted for at the yards of the Cleveland Ship Building Co., will be classed in the Bureau Veritas under the inspection of Capt. F. D. Herriman surveyor for the lake department.

Mr. Sinclair Stewart, chief surveyor for the United States Standard Register of Shipping and Classification Society has been at this port and Chicago all week classing new tonnage and making out specifications for more to be built.

Ore handlers on the Nypano docks quit work on Saturday because their wages were reduced from $1.50 to $1.35 per day. A like cut of 10 per cent. was made on the C. & P. docks, but the men did not stop work. No trouble has yet been experienced from the strikers, who are quiet and orderly.

According to present calculations the steamer North Land is to be launched January 5, which will be the first Saturday in the month. The North West was launched on the first Saturday in 1894, and it is intended to bring out the new steamer for her first trip on the day of the year on which the latter came out.

The master and officers of the Bradley Line steel steamer Alva speak in very high terms of the seaworthy qualities, speed and facilities for handling ship and cargo on the new steamer. The Alva. Capt. Holmes master, is one of the last freight steamers built at the yards of the Cleveland Ship Building Co.

The plans and specifications for the new Cleveland & Buffalo boat, upon which shipbuilders will in a few days be asked to bid, are nearly ready for sending out. The new boat is to be about the size of the D. & C. steamer City of Detroit, with a little more length and less beam. She will have a walking beam engine of the same type as the D. & C liners, and a freight capacity of 800 tons.

Capt. Sam Gould ex-assistant local inspector of steamboats at this port will open his nautical school again this winter and give a course of navigation and seamenship as practiced on the lakes to all candidates desiring to secure original or higher grade licenses. The candidates that received instructions last winter were successful in obtaining licenses and a much larger class is expected to be enrolled this year. Capt. Gould's address is given in the advertising columns of this issue.

Colonel Jared A. Smith, United States Engineer in charge of this district, states that the work of cutting the opening in the west arm of the breakwater would probably not begin until the ice cleared away in the spring. Colonel Smith will advertise for bids on the breakwater cutting. as well as the rest of the work. If the bids do not come within the limit fixed by Colonel Smith as a reasonable price, he will reject all and will do the work himself, the equipment in his hands being sufficient to do it.

Capt. H. A. Hawgood speaks in high terms of the work of the Middle Island Life Saving Corps, Lake Huron. When the steamer Servia grounded this week near Alpena, Capt. Donald McKenzie, keeper of the station acted in an energetic and well advised manner. Materially assisting in saving the large valuable steamer and perhaps lives. Capt. Hawgood says: "Those life-savers under Captain McKenzie did some great work in going to the aid of the Servia. Twice they ran a ten-inch line and did it splendidly. They assisted materially in saving the steamer, and added another good deed in their list of honorable work this season." Keeper McKenzie is, to say the least, one of the best men in the life saving service on the lakes.

The plans suggested by the city council and the committee on navigation of the Chamber of Commerce for widening the river and the entrance to the port are first rate so far as they go, but a great deal more money will have to be expended than the present changes ask for before any adequate accommodation can be given vessels frequenting the port. The widening of the harbor entrance as endorsed by Col. Jared A. Smith, Corps of Engineers, U. S. Army, in charge of improvements and the conservancy of rivers and harbors in this district, is highly commendable. The change contemplated is to build a new west pier to the westward of the present rotten tumbled down structure and then to remove the old "fence" entirely. It has been suggested that the new west pier be built of concrete blocks and given a slight trend to the westward, say an angle of about fifteen degrees so as to give a better fairway for vessels in entering the piers.

Exception is taken to the report of the State Labor Commissioner wherein he takes occasion to lash the Lake Carrier's Association shipping officers as a monopolists dodge to prevent free competition in the labor market. In this connection Harvey D. Goulder, Esq., Counsel for the Association very pertinently observed relative to the labor commissioners agents not obtaining full replies to their singularly worded questions: "The history of trusts show us that their operations are conducted in secret; that not even the most skillful lawyers, backed up by nervy courts, can worm out of them information which they do not choose to give. On the other hand, the Lake Carriers' Association since the date of its organization, has invariably admitted the representatives of the press to its meetings. This fact alone ought to suffice as an answer to the charge of not wishing to impart information."

For one season's work there are few local marine industries that has progressed so well as the Cleveland Towing Co., under the well advised management of Mr. George Elsey. The new company built three steel tugs this year, and by the time the season had been well advanced work had been found to keep a fleet of five harbor tugs as busy as bees. The three steel tugs were named the L. P. Smith, J. R. Sprankle and Marguerite which, with the wooden boats Gates and Sanborn formed a lively little fleet. The three steel tugs are yet in commission and Manager Elsey says that the directors of the company are so well pleased with their general efficiency that all additions to the line will be made of that metal. So well has the business of the Cleveland Towing Co. been managed that plans are now being got out for two more of the most powerful harbor tugs on the lakes, equipped with every modern appliance to facilitate the work of towing. It is learned that the general dimensions of these new steel boats are to be 100 feet in length, 22 feet beam and 13 feet molded depth. The engines are to be fore and aft compound, cylinders 20, 40 by 30. The tug John Gregory, of this line, having completed her season's work attending dredges engaged making the twenty foot channel at Bar Point, was dispatched this week to tow the disabled steamer Chauncy Hurlbut and her consort Clint from Toledo to Detroit, where they will receive final repairs.

VISIBLE GRAIN SUPPLY.

The stocks of grain in Chicago elevators last Saturday evening were 25,748,000 bushels of wheat, 1,404,000 bushels of corn, 1,660,000 bushels of oats, 151,000 bushels of rye, and 43,000 bushels of barley. Total, 29,006,000 bushels of all kinds of grain, against 22,108,000 bushels a year ago. For the same date the Secretary of the Chicago Board of Trade states the visible supply of grain in the United States and Canada as 83,159,000 bushels of wheat, 4,866,000 bushels of corn, 9,740,000 bushels of oats, 477,000 bushels of rye, and 3,809,000 bushels of barley. These figures are larger than the eorresponding ones a week ago by 1,215,000 in wheat and 1,026,000 in corn. The visible supply of wheat for the corresponding week a year ago increased 808,000 bushels.

NOTES.

WALTER N. DEGRAUW, of DeGrauw Aymar & Co., the extensive shipchandlery firm and agents for Tyzack's patent stockless anchor, died on the 23d inst., at his residence, 55 East 66 street, New York, aged 54.

WILLIAM T. Johnston, of the firm of Crawley & Johnston, Cincinnati, has just completed his work at Pittsburg, Pa., where he superintended the erection of his patent steam steering gear on some of the large tow boats that ply the Ohio and Mississippi Rivers. The patent steerer is known as the Cincinnati automatic steam steering gear. Although only three years old the patent is on steamers throughout the country from Maine to California.

THE Christmas number of *Harper's Weekly* will consist of thirty-two pages, including an illuminated cover, and will contain a large number of especially attractive short stories. John Kendrick Bangs will contribute a ghost story; Howard Pyle a novel in outline, entitled "Sailors and Landsmen;" a new writer, Reba Gregory Prelat, a powerful and dramatic story, for which illustrations will be made by C. Carleton. There will be other stories and features appropriate to the holiday season; and drawings by Frederic Remington, Gilbert Gaul, F. Luis Mora, Peter S. Newell, Miss Lydia Field Emmet, W. H. Hyde, and others.

ASBESTOS.

Ed. Wertheim, 207 and 209 Lake street, Chicago, Ill., is agent for the German asbestos goods manufactured at Frankfort-on-Main, by Louis Wertheim. From literature forwarded to this office from the Wertheim house, in Chicago, it is shown that statistics prove that Canada furnishes about seventy-five per cent. of all the asbestos used in the world. The mineral is found in the eastern townships of the Province of Quebec, south of the St. Lawrence River and near the United States frontier, the production of this locality averaging nearly 10,000 tons of asbestos in one year.

It appears that Louis Wertheim, father of the Chicago agent, is a pioneer in the asbestos business. He started in 1867 to study the fibrous mineral, which he found on his travels in the Italian Mountains and which was then only known to scientists and museums of natural history. It would not let him rest to think that such a wonderful product of nature should lie idle in the rock, of no value to trade or civilization; a mineral which does not burn, but yet can be divided into flexible, silk-like fibres, appeared to him as a material liable to be adapted to a great many purposes.

The mineral was originally found in Italy. In 1876 it was discovered when the Quebec Central Railway cut through the mountains south of the St. Lawrence River. Asbestos of a most valuable kind was found, the fibre was different to the Italian, much stronger, yet shorter. In the first year after the discovery, about fifty tons were mined. Since then the production is not enough to meet the demand.

There has been some difference of opinion as to how asbestos originated, and until not very long ago it was thought by many to be a petrified plant. Even now some people think so, and would not believe that nature would ever produce a dead and cold rock which could be split into soft, flexible fibre, thinner than a spider's web. The explanation given more recently, however, is quite plausible, and is generally regarded as correct. The fact that the chemical components of asbestos or, as it is called by mineralogists, "chrysotile," are exactly the same as those of the mother-rock, which is serpentine, indicates a close connection of the two minerals originally. The asbestos is found in narrow veins up to three inches thick, the fibre standing rectangular on the faces of the surrounding rock. This suggests that the asbestos was formed by the action of heat and water, which caused the serpentine rock to crack, and the cracks filled up with the peculiar crystallization of the serpentine rock itself. Chrysotile, generally called Canadian asbestos, is therefore nothing else but crystallized serpentine rock.

The Italian asbestos, which was originally altogether used is somewhat different, it being longer in fibre, sometimes two or three feet long, and is not found in veins, but in pockets of sometimes much, sometimes little importance. While the fibre is longer, it is not so strong as the Canadian fibre, and for that reason does not spin as well and easy. Since the Canadian asbestos has been found, the use of Italian asbestos has gradually diminished, and is now confined to chemical purposes and for some specialties.

Asbestos fibre differs materially from all fibres of vegetable or animal origin by having a perfectly smooth surface like spun glass, while cotton, hemp, wool, silk, etc., under the magnifying glass show tiny fibres or hairs grown on the main fibre. As a consequence, in manufacturing asbestos goods the fibres will not adhere to each other like the other fibres; they will slip past each other, and it takes a process different to all others to accomplish the spinning of an asbestos thread, especially if the best grade of fibre is less than one inch in length on an average. Furthermore, asbestos fibre is only to a certain degree strong and durable, and if not carefully treated in the process of manufacturing it will be torn to pieces and its length reduced. In its natural state, after being mined, asbestos still contains a heavy percentage of hard serpentine rock, which often penetrates the veins and cannot be separated from it except through special machinery. In fibrizing crude asbestos this hard rock is very liable to hurt and cut the tender fibre, and it may be stated that it is one of the most difficult mechanical processes to make the separation thoroughly without hurting the fibre.

Every engineer knows that a piston packing must be made of material which will not injure the piston rod and it is claimed that the best manufacture of asbestos would not hurt even the finest polished wood, even if rubbed against it with great force.

DISCONTINUANCE OF WIND SIGNALS.

U. S DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

WASHINGTON, D. C., Nov. 30, 1894.

INSTRUCTIONS, No 118.

The display of wind signals will be discontinued at all lake points, except Chicago, Milwaukee, Grand Haven, Ludington and Manistee, on the following dates:

On Lake Pepin, December 1, 1894.

On Lake Superior, the date of the closing of the locks of the St. Mary's Falls Canal.

On Lakes Michigan and Huron, December 10, 1894.

On Lakes, St. Clair, Erie and Ontario, December 15th, 1894.

MARK W. HARRINGTON,
Chief of Bureau.

CLEVELAND HARBOR.

Following the opening to be made in the west arm of the breakwater at Cleveland, or when such an improvement is completed, steps ought to be taken to improve the present west pier, if such a ramshackle burlesque on pier construction can be called such. This we surmise could best be done by building a sightly permanent structure of concrete blocks about one hundred feet to the westward of the present "man trap" nuisance to vessels and disgrace to the entrance of the port. The east pier is a dilapidated eyesore, already partly appropriated for private uses, but there is still a chance for improvements to the westward.—*Editorial note in* THE MARINE RECORD, *Nov.* 8

"There is a growing tendency on the part of those in high influence to make the harbor of Cleveland correspond with the probable increase in the lake commerce which now seems likely to obtain in the next few years. A very important branch of this work is a proposition to widen the river at its mouth. The time seems to be ripe for such an undertaking, which is receiving the earnest attention of the committee on navigation of the Cleveland Chamber of Commerce. The west pier is pronounced to be in a very bad condition, and is ill-shaped as well. It was built at different times, and the engineers in charge doubtless did the best they could with the limited appropriations at their command each year. But an examination shows that it can be replaced entirely at an expense not much above what would be required to rebuild it. There is a jog in the west pier which makes the river narrower from the mouth to a point about five hundred feet shoreward than it is from the latter point to the life saving station. A line of piles driven in a line from the life saving station dock to the outer section of the pier prevents the use of that much of the river, which is fenced off, and looks as though it might be intended for a fish hatchery. The effect is unsightly and it is thought that the whole could be improved, at a reasonable cost, by building a new west pier, the old pier would then be removed and the entrance to the port be made more easy of access, and would, as well, be more indicative of the importance of the port. Should this project be carried out, it is the hope of the committee that the appropriation from the government would be sufficiently large to warrant the construction of a pier of which the upper part, from two feet below the water line, should be of concrete. This would give the pier a more substantial appearance, and would really be more enduring, the stone required being procured at a small expense.—*Cleveland Leader, Nov.* 28.

CONTRACT CLOSED BY THE CLEVELAND SHIP BUILDING CO.

The Cleveland Ship Building Co. has just closed a contract for a new freight steamer, which will be built to the order of M. M. Drake of Buffalo and others, the persons interested with the managing owner being residents of Pittsburg, Chicago, Duluth, and Buffalo. The new boat is to be a sister ship to the I. W. Nicholas, which the Cleveland Ship Building Co. completed this summer for the Minch Transportation Co. of Cleveland. It was due largely to the record made by the Nicholas that the present contract was awarded, as Captain Drake is a package freight man, and has had an opportunity of knowing exactly what the Nicholas has been doing, since her maiden trip, September 17. The general dimensions of the new steel steamer are to be 342 feet over all, 324 feet keel, 42 feet beam, and 26 feet, 3 inches molded depth. She will have four feet sheer forward, and two feet aft, which will give her the straightback appearance. She will have ten hatches, each 8 feet long by 29 feet wide, and each supplied with double hoisting drums, and by a main line of shaft running fore and aft turned by a 12x12 inch high pressure engine to facilitate the landing of general cargo. On each side there will be four large gangways, with single plate ports having special arrangements for opening and closing same. The lower hold is to be divided into three separate watertight compartments. The water bottom will be four and one half feet deep, with eight water tight compartments. The spar deck is to be of steel, and the main deck of wood. The propelling machinery will consist of one triple-expansion engine, with cylinders 20, 33, and 54 inches in diameter with 40 inches stoke of piston. She will have two Scotch type boilers, 12 feet 4 inches in diameter, by 13 feet long, capable of carrying 170 pounds working pressure. Her screw will be 13 feet in diameter, by 15 feet pitch. The auxiliary machinery will include the 12x12 hoisting engine already mentioned, and an American ship windlass and capstan forward, and another capstan of the same make aft. She will have a Williamson steam steerer, and Dunn's patent stockless anchors.

As the new steamer is to be an exact duplicate of the Nicholas, some of the latter's records may be quoted as showing the carrying capacity. The Nicholas took to Duluth four cargoes of coal averaging 3,100 tons, and brought down four cargoes of package or general cargo, averaging 2,950 tons. She also brought down one cargo of wheat measuring 109,000 bushels. All this was done on a little over fourteen feet draft which shows her to be easily what was claimed for her when built—a 3,200-ton boat on fifteen feet of water.

The Cleveland Shipbuilding Company are getting a better price for the new boat than for the Nicholas, not only because there has been a slight advance in the price of material, but for a further reason, namely, that the coal companies at Duluth find the Nicholas the handiest boat to discharge that ever they have had at their docks and it is learned that they have instructed their agents at lower lake ports to have the Nicholas chartered at every opportunity and as regards her general cargo facilities, the Anchor Line are loud in the praises of the new boat and the Drake steamer, as we have said, will be a counterpart of her. Much credit is due to Mr. James Wallace for closing this contract for the Cleveland Shipbuilding Co. The Otis Steel Co. has been given the order for the plates and the Carnegie Steel Co., Limited, the rest of the metal material.

THAT JONAH STORY.

A little boy often teased his aunty to tell him stories, and thinking it over one day, her conscience pricked because she had not told him more bible stories. So next time he came she tried the Jonah affair. He did not dispute it, but she heard him remark to some of his little friends as she sat by the open window, that his aunt Emma was just an awful liar, just awful. An aged Scotchman was telling the story as he heard it in the old county when he was a young man. It was that when the storm came they were not very far from land. Jonah owned up that it came because of his sin and advised they throw him overboard, which they did after trying in vain to save him and themselves. By the wind and waves he was carried ashore and cast upon the beach just in front of a little public house called the *Whale*, that for a sign, had over the door a whale of wood and naturally painted. Some fishermen carried him in and dosed him with Scotch whiskey to keep him from catching cold. Now, he liked it so well, he kept dosing himself more, and so was drunk three days and nights, and then the barkeeper found that his money was all gone and so kicked him out. It is said that practice has come down to our day. But do you believe the story as originally told?

Turn to the book of Jonah in your bible and read it carefully and you will readily see that it is a fish story. Fearing that many of our readers will not take this trouble we will give the important verse. You can consult your bibles if you please and see if we have given it correctly. First chapter of Book of Jonah, seventeenth verse:

"Now the Lord had prepared a great fish to swallow up Jonah. And Jonah was in the belly of the fish three days and three nights."

MARITIME LAW.

ANDERSON v. THE RAVENSDALE et al.

District Court, S. D. New York. March 2, 1894.

SHIPPING—PERSONAL INJURY—HOISTING CARGO—NEGLIGENCE—FELLOW SERVANTS.—Where the libelant, a longshoreman, was injured by the fall of a draft of boards which were being hoisted aboard a steamer, and the evidence showed that the cause of the accident was the improper fastening of the draft, so that the draft did not tauten as it should have done when the draft went up, held, that it was immaterial by whose fault this occurred, since it was certainly done by one of the several workmen engaged in the same common employment, which would prevent any recovery by the libelant.

VESSEL OWNERS' TOWING CO. et al. v. WILSON et al.

Circuit Court of Appeals, Seventh Circuit. May 31, 1894.

1. NEGLIGENCE—OBSTRUCTION IN NAVIGABLE STREAM.—Contractors who took up piles in repairing a bridge, which had been driven in the draw of the bridge to ward off vessels from the abutments of its piers, which projected under the water, held liable for injuries sustained by a vessel which subsequently struck against such abutments.

2. TOWAGE—NEGLIGENCE.—A loaded vessel, while being towed down the Chicago River in broad day, struck against the abutments of a bridge pier extending below the surface of the water. These abutments had existed for 25 years, but had been guarded by piles which had been lately removed. Held, that the tug was guilty of negligence.

The Wallula was wholly under the control of the tug, and unable to help herself. The tug was "the dominant mind or will of the adventure" (The Fannie Tuthill, 12 Fed. 446), and took the whole responsibility of her navigation (The Express, 3 Cliff, 462 Fed. Cas. No. 4,209). The collision occurred in broad daylight, and under such circumstances the fact of the collision creates a presumption of negligence on the part of the tug. The Delaware, 20 Fed. 797. Engaging in the service of towing up and down the Chicago River, the tug was bound to know the channel, and whether, under the circumstances, it was safe to make the venture of passing the draw. The Margaret, 94 U. S. 494. And that obligation imposes upon the master of the tug, before undertaking the towing, a knowledge of the condition of the bottom and of the depth of water in the river, and of the existence and location of any well known obstruction. Here this sunken obstruction had existed for some 25 years, and had been guarded, to the knowledge of the master of the tug, by these protection spiles. Prior to undertaking this towage, he knew those spiles had been removed. He knew those spiles stood out six feet from and indicated that it would be dangerous to go nearer the face of the abutment. He had seen these abutments in course of construction. The master of the tug sought to excuse himself by asserting that he supposed everything had been torn out when the piling was taken down and yet the abutment stood there facing him with the protection gone. He confesses that his idea in towing the Wallula through the draw was simply to "keep her away from the visible thing." He assumed that the abutment proceeded on the same angle to the bottom of the river, notwithstanding he knew that the spiles stood out six feet from the face of the abutment, while at other bridges they stood out but two feet. With this knowledge, and this imperfect comprehension of his duty, and in view of the fact that the Van Schaick could give but little assistance in steering the Wallula, by reason of the position of the Palmer in the channel, it was the duty of the captain of the Carpenter to have had the Wallula under control and he should not have permitted her to enter the draw at such a speed and upon such an angle that collision with the abutment was inevitable. The decree will be affirmed.

OWNERS OF THE PLYMOTHIAN'S CARGO v. THE VICTORY AND THE PLYMOTHIAN.

District Court, E. D. Virginia. September 18, 1894.

1. COLLISION—RULES AS TO PASSING—COAST WATERS.—Tide waters, navigable from the ocean by ocean craft, are "coast waters," within Act March 3, 1885 (23 Stat. 438 et. seq.), adopting the revised international rules and regulations for preventing collisions at sea (article 21 of which embodies the rule "Keep to the right"), and declaring that they shall be the rules for navigation on the high seas and in all coast waters, except as are otherwise provided for; the exception being defined by the further provision that "nothing in these rules shall interfere with the operation of a special rule duly made by local authority, relative to the navigation of any harbor, river, or inland navigation."

2. SAME—RIVERS—HARBOR RULES.—Part of a river not within the territorial limits of a city, though part of its harbor, is not affected by a rule of navigation for the harbor ordained by the city, under provision of Act March 3, 1885, that a special rule, duly made by local authority, relative to the navigation of any harbor, shall not be interfered with by the international rules of navigation.

3. SAME—KEEPING TO THE RIGHT.—When the steamers P. and V., the former going 4 miles and the latter 6 miles an hour, were at a distance of 1⅛ miles, approaching each other, in clear daylight, along a narrow channel, which was in full sight, and governed by international rule 21 ("Keep to the right") the P., which was obeying the rule, signaled the V., which was not obeying it, that they should pass port to port. When over 1,000 yards distant, the V. answered with a cross signal, that they should pass starboard to starboard, without there being any cause therefor, and without giving any signal to indicate that there was such cause. The P. thereupon repeated its signal, which the V. promptly answered with its cross signal, whereupon both gave alarm signals and backed, without, however, preventing a collision. Held, that the V. was liable therefor, and the fact that, shortly before the collision, she had a schooner under her starboard side, and that this and two other schooners, which she had met shortly before, passed on her starboard, was no excuse.

4. SAME—ABSENCE OF LOOKOUT IN BOWS.—The fact that a steamer had no lookout forward at the time of a collision will not render her liable for the cargo, as having contributed to the collision, she being navigated at the time by a pilot, with her master on the main bridge acting as lookout, and she having omitted nothing which she ought to have done, or which she would have done had there been a lookout in her bows.—*Federal Reporter.*

"SOO" CANAL TRAFFIC.

A comparative statement of the commerce east and west bound through St. Mary's Falls Canal, Mich., for the month of November, seasons of 1893-4, as furnished by the canal officials, is as follows:

EAST BOUND.

ITEM.	Designat'n.	Sea. 1893.	Sea. 1894.
Copper	Net tons	11,999	12,914
Corn	Bushels	115,530	
Building Stone	Net tons	1,427	1,122
Flour	Barrels	1,299,474	1,502,555
Iron Ore	Net tons	281,384	433,500
Iron Pig	"	4,087	1,405
Lumber	M.ft.B.M.	66,813	70,295
Siver Ore	Net tons	40	
Wheat	Bushels	5,203,478	7,993,794
Unclassified Freight	Net tons	26,026	47,669
Passengers	Number	457	472

WEST BOUND.

ITEM.	Designat'n.	Sea. 1893.	Sea. 1894.
Coal, Anthracite	Net tons	303,484	97,454
Coal, Bituminous	"		225,268
Flour	Barrels		
Grain	Bushels	2,306	
Manufactured Iron	Net tons	1,869	7,310
Salt	Barrels	44,925	63,287
Unclassified Freight	Net tons	37,020	43,688
Passengers	Number	106	115

East bound freight, net tons,	1,007,672
West " " "	383,214
Total	1,390,886

THE PANAMA CANAL.

The Panama papers commenting upon the resumption of the work on the unfinished canal, has the following to say relative to the present outlook:

"Now that the excitement of the news received here a month or so ago regarding the formation of the new canal company and the resumption of work is wearing down it is seen that there is very little in the new scheme after all.

"The extraordinary low rate of seventy cents per day, which at the exchange to gold is only worth about thirty-eight, being paid workmen, finds but very few eager for the hard labor of canal work. All the negro laborers along the line struck last week for a dollar a day, but finding the company was not anxious about them some of them returned to work at the old figure.

The high price of food stuffs makes it almost impossible for men to live on these wages.

"One item alone may be cited: Meat formerly selling at 10 cents per pound is now ticketed at 35 cents; everything else in proportion.

"A number of Europeans, chiefly Italians are laboring in the places of the negroes.

"People now declare that the showing the new company—which they say is no new company at all—is making is only a game of bluff to get an extension of the concession.

All the old machinery and belongings of the company, rotting and rusting here for years, has been puttied up and given a coat of paint to make a good showing, but examination proves that they are almost useless. It is the general impression now that Frenchmen will never complete the canal. The Isthmians have great faith in Americans for such an undertaking, and compare the great amount of work done by the American Dredging Co. with the small performance of the French in the same time. In the face of the foregoing Americans feel more like supporting and carrying through to a successful issue the Nicaraguan project.

A GOOD THING FOR THE LAKES.

The Cunard Line Steamer Campania will on her next trip test the value of the instrument, patented lately in all maritime countries as the invention of Lieut. Beehler, of the hydographic office at Washington, and given the distinctive name of solarameter.

The advantages claimed for it, if born out by actual experience, will give the new invention precedence over the time-honored sextant. In explaining his instrument, the lieutenant calls attention to the unreliability of compasses aboard iron or steel ships. A metal ship with effected compasses is liable at a time to get out of her cause in thick weather. With this invention of Lieut. Beehler's it is possible at all times to determine the error of the compass. A great point is its freedom from the necessity of having absolutely observations of the sun. When the sun is obscured for days at a time the ship master has to depend upon dead rockoning, in many cases productive of disaster. It is seldom that twenty-four hours pass by without either some star or the sun showing itself, and, although it is a difficult matter to take an accurate observation of a star with a sextant, it is perfectly easy to do so with the solarometer.

In appearance the solarometer is more like a skeleton base ball than anything else. It rests upon a stand of cast-iron about 30 inches in diameter and 4 feet high. On top of this stand there is a large cast-iron bowl, balanced on knife edges resting on a steel ring, the whole supported on gimbals, a device used in keeping nautical instruments motionless and horizontal while the ship is pitching and rolling. The cast-iron bowl is weighted at the bottom to make it swing like a pendulum, and inside the hemisphere, resting upon a floating stand, is the instrument proper. The float is made of two parts and consists of two bowls, concentric hemispheres. The inner bowl is filled with lead, from which rises a steel column holding the solarometer. The base of the bowl is flat, parallel to the horizontal plane passing through the top of the bowl and at the center of the bottom is a ball and socket joint which holds the two bowls together. Annular grooves are cut into both bowls to keep them from rocking, after the same theory as bilge keels and both bowls float in mercury. The weight of the inner bowl filled with lead, determines the amount of mercury required between the inner and outer floating bowls. The float is entirely independent of the outer bowl, the mercury alone holding it suspended. The instrument consists of a series of concentric rings representing circles.

The principle upon which the instrument works is that it is at a certain moment fixed at the intersection of two circles, one passing through the poles, the other through the observer's zenith. No elaborate calculations are necessary, the instrument doing all the work.

VALUE OF COVERINGS FOR STEAM PIPES.

A certain test of steam pipe coverings leads to the conclusion that it cost $15.40 to run 100 feet of naked two-inch pipe at from 70 to 80 pounds pressure for one year of 3,000 working hours, with coal at $2 per ton. With the least efficient of insulating coverings used in the test this loss could be reduced to $4, with the most efficient to $2.64. Striking as are these figures, they are probably below the cost of actual practice, for a steam pipe is under pressure usually more than ten hours per day, and $2 a ton is below the average cost of coal. Prof. Charles B. Gibson, in some tests for the Manufacturers' Mutual Insurance Company, some years since, reached the conclusion that with coal at $4 per ton and 3,000 working hours per year, the loss from a naked two-inch pipe was 64½ cents per linear foot—considerably more than Mr. Dickinson's test would show even with coal at $4 per ton. However, the lowest of his estimates shows the importance of covering the pipes, and it is a good thing to attend to before the present loss is increased by the coming cold weather.

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CLEVELAND, O., DECEMBER 6, 1894.

THE last session of the Fifty-third Congress opened in both houses on Monday.

OUR thanks are due the U. S. Commissioner of navigation for a copy of his annual report for 1894.

THE Pabst and Schlitz brewing companies own conjointly twenty-seven miles of river frontage on the Tallahatchee.

IN addition to the list of lake dry docks with their dimensions and other particulars, published in THE RECORD November 22, we are pleased to mention that the Craig Ship-Building Co., Toledo, O., has in course of construction a wooden dry dock 400 feet in length, 50 feet in width at the gate and carrying 16 feet over the miter sill.

CHICAGO harbor officials were gracious enough to allow the bridges to be swung open on Saturday afternoon so as to allow the large steamer E. C. Pope to leave port with her last cargo for the season. Favors to vessels at the "Windy City" are few and far between, so we take the opportunity to chronicle the last act of courtesy to tonnage at that port.

THE next convention of the International Deep Waterways Association is to be held in Cleveland. The main object of the organization is to open up a waterway to the coast. There is no doubt but that the connection will be made at some time, but it would be suicidal for lake vessel owners to advance such an undertaking with a view to its early completion.

THE Canadian fishery cruiser Petree has been quite busy lately picking up and confiscating nets set at the west end of Lake Erie and owned by American fishermen. The master of the Petree is positive that the nets were in Canadian waters while on the other hand the fishermen say that they took great care not to cross the dividing line. A few temporary buoys properly located on well known bearings, would overcome these annoyances as well as the monetary loss and inconvenience to American fishermen.

THE change from wood to iron and steel has been the chief factor in the decadence of our mercantile marine. The United States now produces metal enough to compete with the world and there is no reason why this country should not gain the ascendancy over all other nations in shipping. Lake ports under the coastal laws are protected and the result is an abundance of high classed modern tonnage. Would not legislative assistance upbuild the ocean mercantile marine also?

THE depth of water at the St. Mary's Falls canal fluctuated eight inches during twelve hours on Nov. 26. The draft at 8 a. m. on that date was 14 feet, 4 inches and at 8 p. m. 15 feet. It is useless to aim at the impossible, but a knowledge of an eight inch rise would mean the transportation of thousands of tons of commerce and a corresponding increase in vessel earnings.

CRUISERS FOR THE LAKES.

Through the limitations of the treaty between this country and Great Britain the great inland seaboard of lakes is defenseless, save for the presence of one small warship, the Michigan, and this in case of war would be powerless to protect the cities of Buffalo, Cleveland, Detroit, Milwaukee and Chicago, and the other lesser cities along the shores of the chain of lakes, any one of which could be quickly laid subject to ransom or devastation, so says a contemporary.

The United States has, however, always carefully regarded this treaty, in letter and spirit. On the other hand the Canadian government is proceeding with suspicious expedition to make it possible at a moment's warning to send her gunboats from her naval stations on the River St. Lawrence to any part of the United States coast. Not only in this respect is Canada preparing for a possible emergency, but a fishing patrol fleet is maintained, consisting of at least two staunch and speedy boats, capable of being converted into serviceable cruisers by equipping them with guns in store for the time of need, although they are only the size of powerful tug boats.

On the other hand a spirit of patriotism has been shown by the Northern Steamship Co., in the construction of the steamships Northwest and Northland, either of which may be transformed into efficient cruisers in short time.

The Northwest is a twin-screw vessel, with a speed of 19 to 21 knots, her engines are quadruple expansion, with 28 boilers and 56 furnaces, consuming 126 tons of coal a day. She is adapted to war duties by a long deck forward, offering position to one or more 4-inch guns or 6-inch guns; on the after-deck there is also room for 4-inch or rapid-fire guns. The open waist affords ample space for numerous small guns, and the openings for freight could be used for weapons. A powerful search light is part of the equipment. Painted white, with three towering smoke stacks, the Northwest bears a close resemblance to the cruisers of the navy.

The Northland, a sister ship, will be put in commission during next year; then the two swift vessels will stand ready to be efficient protectors of the lake coast, and able to cope with anything of a hostile nature at present afloat in inland waters.

It remains now for the government to establish depots of arms and munitions for these vessels at convenient ports, so that wherever they might be the fitting out could be done with dispatch. Then the safety of the lake front will be assured.

REPORT OF THE COMMISSIONER OF NAVIGATION.

The annual report of Commissioner of Navigation Hon. Eugene T. Chamberlain shows that only six American steamships, including the New York and Paris, crossed the Atlantic, and only seven the Pacific during the past year, while from New York and Philadelphia alone 33 steamships, mainly new steel vessels, owned chiefly by Americans, crossed regularly to Europe under foreign flags.

American enterprise, he says, is a century in advance of the law, for Americans own more steamships forbidden by the registry law to fly American colors than they own steamships in foreign trade under the Stars and Stripes. In 35 years only one American steamship has visited Hamburg, the greatest continental port, and last year only two sailing vessels entered there. Every bushel of grain which left New York for Europe last year was carried under a foreign flag; of 11,000 vessels passing the Suez Canal in the last three years only six have been American.

The report shows the extent to which Americans have adopted the policy of foreign shipowning and the country's consequent loss of maritime prestige and profit. Government aid to shipping by Great Britain, France, Italy and other nations is reviewed, showing that only three per cent of the British merchant marine receives any government compensation, and giving statistics concerning other countries. Cost of construction and operation are examined, with full figures on comparative wages, and foreign and state taxes are compared. Amendments to the net tonnage and tonnage tax laws, the abolition of registry bonds, and an extension of the power of the Secretary of the Treasury to mitigate or remit penalties on sailing vessels are recommended.

The report, comprising 390 pages, reviews means of steam communication between the United States and foreign countries and gives port charges at American ports, financial operations of the world's greatest steamship corporations, the world's tonnage, and the annual statistical table.

A SPLENDID RECORD.

The annual report of Superintendent S. I. Kimball, of the U. S. Life-Saving Service, detailing the splendid record made by his bureau in the cause of humanity, states that 380 vessels in distress were aided by the life saving service during the year. There were on board these vessels 4,054 persons, of whom 3,993 were saved and only 61 lost. The number of shipwrecked persons who received succor at the stations was 658. The estimated value of the vessels and cargoes involved in the disasters was nearly ten million dollars. Of this amount $7,688,000 was saved. In addition to the number of persons saved from vessels there were 83 others rescued who had fallen from wharves, piers, etc., and who would have perished without the aid of the life-saving crews.

The number of disasters by reason of storms was greater than in any previous year since the introduction of the present system.

The cost of the maintenance of the service during the year was only a little over a million and a quarter dollars.

During the past year the telephone lines of the service have proved more emphatically than ever before their indispensable value as an aid to prompt and efficient life-saving operators.

On every necessary occasion two or more crews have been assembled by this ready means of communication between stations, and whenever needed tugs and other aids to the shipwrecked have been summoned without delay. The lines have been extended and improved as much as possible. The system continues to attract foreign attention, and during the past year the details of its operation have been examined in person by the representatives of a royal commission of Great Britain, who treats of it in an official report with warm commendation and recommends its adoption by the royal national life-boat institution throughout Britain and her provinces.

IN THESE days of azimuths, solar, lunar and stellar observations for determining the error of compasses and pointing out a ship's position there is but little chance of vessels being lost or stranded by shaping insecure courses through an ignorance of the vessel's position at the time it may shut down thick. Millions of craft have traversed the earth's waterways adequately navigated and without meeting with the slightest mishap, so that there is reason to doubt whether the newly invented solarometer will fill the long felt want said to exist among navigators. Taking the universal stranding casualties into account it will be found that during the prevalence of thick weather, tides and currents are the agents at work in landing a vessel, and we surmise that under such conditions even eighteen solarometers would do but little to assist the shipmaster in determining how much or in what direction his vessel was sliding off with the current as long as she was heading her course and maintaining a known speed. Safety rather lies in a well constructed compass, properly adjusted and closely watched after wards for changes in deviation on all courses.

IT is sometimes held that floating property returns better dividends in fairly good times than general industrial investments ever pay. This is true in a measure, and only so, for although all natural and untoward risks may be covered by insurance and the premiums met out of the vessel's earnings, there is still the factor of depreciation of property continually going on, so that in some cases a 10 per cent. annual dividend may mean to the ordinary shareholder simply a new dollar for an old one, or, in the case of an apparent 5 per cent. profit on the investment, an actual 5 per cent loss would occur if and when depreciation of value in the property amounted to 10 per cent., hence, a loss instead of a gain.

WHY should not chief engineers pass the pilotage examination for the lake routes on which they may be trading and secure the two licenses each year? For that matter why should not masters and pilots procure chiefs and assistant engineers licenses for the special tonnage in which they are serving. If annual licenses are a good thing and they are so easy to get, why, lets have lots of them.

LAST year saw the establishment of the first hydrographic office on the lakes. This year the second one has been placed in operation, and now requests are being made and petitions circulated for the installation of several more. Lake Michigan is taken care of from the Chicago office, Lake Erie by the Cleveland branch, but the superior and larger lake is left to wander around at its own sweet will. There is more than one excellent locality on Lake Superior where a station could be advantageously placed, though Duluth is after it and will probably get it for that reason. Lakes Huron and Ontario are also entitled to a fair consideration.

A BILL is to be introduced in the next congress to put the life-saving service on the same footing as the army in important respects. The bill provides for an increase in the pay of the life-savers, for their retirement on half pay after a specified period of service or disability incurred in the service and for a pension to the families of those who lose their lives in the discharge of their duty. Such a bill should be passed without delay, as a measure of justice to a body of brave men, who return in lives and property many times the cost of their wages to the government.

A FIRM of British ship owners, Messrs. Thomas Wilson Sons & Co., of Hull, fitted the Babcock and Wilcox type of marine water-tube boilers on their large steamer Nero about a year and a half ago. They have found the merits of the type so well established that they have now given an order to the manufacturers for 1,300 H. P. to be fitted into another of their ships. These boilers will be constructed entirely of open-hearth steel forgings and will carry a working pressure of 225 pounds of steam per square inch.

AN item in our issue of Nov. 29, stated that the preliminary survey for the Lake Superior-Mississippi canal had been completed. We now learn that the survey is still in its preliminary stages. No reports have been made nor estimates submitted and Major Clinton B. Sears, corps of engineers, U. S. Army, the district engineer for river and harbor improvements at the head of the lakes, says it is probable that a complete report of the route to be surveyed will not be ready before next fall.

THE annual report of the commissioner of navigation may be considered as an argument for free ships which of course is in accordance with the vews of the administration or at least the executive head thereof. The commissioner gives numerous instances of the decadence of the merchant marine in the over-sea trade and argues that it cannot be built up again without the repeal of existing laws which he says hamper our merchant service in cargo and passenger lines of travel.

To connect the headwaters of the Mississippi and thereby St. Paul and Minneapolis with Duluth by a ship canal is an insane conception and incomparably more ridiculous than the Manchester canal from Liverpool to Cottonopolis. The citizens of Manchester paid for their "whistle," and now they know it, but the twin cities would like to tax all states to pay for their "white elephant," though we think the project will hardly go beyond the preliminary stages for a few decades yet.

LAKE SHIPBUILDING.

With the closing of a contract this week by the Cleveland Ship Building Co., a brisk winter's work is heralded for all lake shipyards. The George T. Arnold Transportation Co. has also closed a contract with Heath's Ship-yard Co., Benton Harbor, Mich., for the construction of an elegant passenger steamer, to run on short excursions to Mackinac Island. The new boat will be 120 feet long, 22 feet beam and 20 feet molded depth. She is to be completed by next spring. The builder's guarantee a speed of fifteen miles per hour.

The largest deal on hand, however, is that of the Minnesota Steamship Co. who intend going into the towing business extensively and besides the two large steel tow barges now being built at the yards of the Chicago Ship Building Co. they are getting out plans for two more consorts and two steamers. The Graham and Morton Transportation Co., the Goodrich Line and the Cleveland & Buffalo Line are also figuring on large new passenger steamers, the latter to be a light draft twin screw propeller, according to the latest advices, although the specifications are not yet completed. The Northern Steamship Co. will also be in the field this winter for new tonnage having had to charter outside boats all season as their trade has by leaps and bounds grown so fast that the large fleet of six 3,000 ton steamers and the two large passenger boats are not sufficient to meet the transportation demands of the company.

The late Cleveland owners of the Neosho, principally Capt. John W. Moore and Mr. R. R. Rhodes are also considering plans for replacing the tonnage which has gone out of their hands this season and Mr. M. A. Hanna it is expected will shortly place an order for a large steel steamer which will probably go to the Globe Iron Works Co. the firm now engaged in getting out plans for the twin screw passenger steamer for the Cleveland & Buffalo Line.

It is noteworthy that all of the contracts now talked of are for high classed tonnage including several passenger steamers and large steel freight steamers. The owners of the whaleback passenger steamer Christopher Columbus hold their annual meeting this week in New York and it is rumored that the order for another passenger whaleback boat is likely to be one result of the meeting of the directors of the company. Mr. Wheeler of W. Bay City has in view a large contract for coast tonnage which is likely to be soon closed. It is also noted that the Cleveland Towing Co. will place an order this winter for two large steel harbor tugs equipped with every modern appliance.

STAGE OF WATER AT ST. MARY'S FALLS CANAL.

DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

Depth of water at the St. Mary's Falls Canal for the week ending Dec. 6, 1894:

Nov.	29	8 a. m.,	14	feet	3	inches.	8 p. m.,	14	feet	3	inches
"	30	"	14	"	3	"	"	14	"	3	"
Dec.	1	"	14	"	6	"	"	14	"	6	"
"	2	"	14	"	4	"	"	14	"	3	"
"	3	"	14	"	3	"	"	14	"	4	"
"	4	"	14	"	4	"	"	14	"	4	"
"	5	"	14	"	4	"	"	14	"	3	"
"	6	"	14	"	6	"	"				

SUBMARINE DIVING GEAR.

CHICAGO, December 4, 1894.

To the Editor of The Marine Record:

I wish you would state in your next issue a description of the suit the diver wore who went down to the steamer Pewabic, loaded with copper, sunk in Lake Huron; also address of a manufacturer of diving suits and apparatus. AN OLD SUBSCRIBER.

The submarine diver named Pelkey that was last down at the Pewabic had on a patent metallic suit the particulars of which we are unable to give, as unfortunately he lost his life in the attempt. For the names and addresses of manufacturers of diving suits and other submarine apparatus consult our advertising columns.—ED.

REPORTED BY THE LOOKOUT.

Ashtabula ore receipts and coal shipments for the season will aggregate about 3,000,000 tons, one-third being coal.

Ice is forming in the upper end of Green Bay very rapidly, and navigation will close for the season about Thursday.

The lake life-saving stations will all be closed December 15, except that at South Chicago, which went out of commission Wednesday.

George D. Kitzinger, of Manistee, has sold a quarter interest in the steamer Mark B. Covell, to Otto Kitzinger, of the same port, for $3,684.

Navigation at Sault St. Marie will probably close Friday, when the steamer Globe passes down. The steamer Mather passed down on Thursday.

The steamer Duncan City is receiving extensive repairs at the Wolverine dry dock, Port Huron, and her machinery is being repaired at the Phœnix Iron Works.

Parties at Marine City have offered a bonus to the Dry Dock Iron Works, of Port Huron, to remove to that port, and have guaranteed to build them a dry dock if they will do so.

The lightships on the reef at the north end of Lake Michigan will be kept in position until December 10, if the weather permits. This is about ten days later than last season.

The season of navigation is already longer than last and seems to grow longer each year. Last year the Soo Canal closed December 6. This year it will close a couple of days later.

The U. S. Life-saving Service embraced at the close of the last fiscal year 366 stations, 182 being on the Atlantic, 51 on the lakes, 132 on the Pacific and one at the Falls of the Ohio, Louisville, Ky.

The following vessels have gone into winter quarters at Holland, Mich.: Steamers City of Holland, Soo City, Mabel Bradshaw, Music, and tug Lizzie Walsh. Schooners R. Kanters, Addie and Rambler.

Tenders will be received up to the 20th inst. by the collector of customs at Amherstburg, for the purchase of the tug E. C. Eggell, which was seized for illegal fishing in Canadian waters a year ago.

Abram Smith & Son, of Algonac, are building a steam barge, 200 keel, 36 feet beam, and 12½ feet hold, with capacity for 110,000 feet of lumber. She will class A1. If not sold they will use her to tow their schooners.

The steamer Pioneer cleared from Marquette on Monday morning for Cleveland with the last cargo of iron ore for the season. Had the present mild weather been anticipated, the mines would have forwarded several more cargoes as no ice was in the harbor when the Pioneer cleared.

The closing down of the ore season at Ashland, gives a total of 1,053,938 tons from the northwestern ore docks, 654,642 from the central docks. This total of 1,707,580 has only been exceeded in 1890 and 1892. Ashland has shipped since 1887, 13,000,000 tons, or nearly 700,000 carloads of iron ore.

A dispatch from Toronto says that in all probability the Campana will be placed next season on the route between Windsor, Detroit and Sault St. Marie, Mich., touching all along the Canadian shore. This route was the one that the Cambria was on this year and it was very successful. On a number of trips the boat had to refuse passengers and the freight business was very large.

The Canadian steamer Enterprise, which was wrecked on North Point reef and abandoned by her owners some time ago as a total loss, was afterwards released by Gilchrist & Fletcher, of Alpena. After having been rebuilt at Bay City the vessel has been towed to Alpena where the machinery will be put back, her cabins re-constructed and she will be given an American registry.

Capt. Jarvis Wylie, of the tug Sunol, was washed overboard and drowned outside Ashtabula Harbor piers last week. He was 31 years of age, had sailed from his youth up and had been master of a tug ten years. He had a remarkable record for saving lives, and performed several acts of remarkable heroism. Two years ago he took off the entire crew of a Canadian schooner which foundered below that harbor, and in May, 1893, he saved the captain and crew of the Pelican in one of the worst storms that ever swept over Lake Erie.

The shipments of forest products from Saginaw River ports by lake during the month of November were as follows: Bay City, lumber, to Cleveland, 7,377,000 feet; Buffalo, 2,000,000; Chicago, 1,730,000; Toledo, 1,580,000; Tonawanda, 1,530,000; Lorain, 600,000; Sandusky, 558,000; North Tonawanda, 550,000; Black Rock, 300,000; total, 16,225,000; shingles, to Toledo, 750,000. Salt, to Duluth, 7,500 barrels; Cleveland, 500. Saginaw shipments, lumber, feet. Buffalo, 1,615,000; Tonawanda, 628,000; Cleveland, 941,000; total, 3,184,000.

In former years marine insurance expired at noon on November 30, but with the increasing size and strength of lake boats the tendency has been to continue in service until the waterways were actually blocked by ice. On large steamers of high grade insurance now runs until noon December 5, with an extension of five days more at the option of the companies and on special terms. This season vessel owners seem to be anxious to keep their tonnage at work as long as possible with the hope of increasing the small dividends. if any, which will be paid at the end of the year.

The Northern Michigan Transportation Co. has libeled the steamer Waverly on a claim of $4,000 for salvage. The company own the steamer Charlevoix, and in the libel alleges that on the night of September 17, 1893, the Charlevoix sighted the Waverly helpless on the east shore of the lake, in a gale. She was loaded with corn and her machinery had broken down. The Charlevoix had on board sixty passengers and a valuable cargo; she went to the assistance of the Waverly and finally took her in tow, starting for the west shore in the gale, and had great difficulty getting the Waverly to Chicago in safety. The Waverly was valued at $40,000 and her cargo at $22,000. The Charlevoix was valued at $65,000 and her cargo at $15,000, and the libelant thinks that $4,000 is a very reasonable claim for salvage, considering the value of the property risked and salved.

NICARAGUA CANAL RESOLUTIONS.

The following resolutions regarding the Nicaragua Canal were adopted by the Huinboldt Chamber of Commerce and forwarded to Congress:

TO THE HONORABLE SENATE AND HOUSE OF REPRESENTATIVES OF THE UNITED STATES, IN CONGRESS ASSEMBLED: The citizens engged in business in Eureka and Humboldt county, assembled at the call of the Humboldt Chamber of Commerce, most earnestly recommended and urge that your honorable body, immediately after convening at the session in December, take up, consider and finally dispose of the questions relating to the Nicaragua Canal, to the end that some definite plan of construction may have the direct approval of the United States government and that the construction of that great water highway may proceed and be completed under American auspices.

Your petitioners are fully aware of the doubts that so long had weight with statesmen, engineers and capitalists in regard to feasibility of the enterprise; they are also alive to the great differences of opinion that have arisen regarding the details of construction and the advisibility of intervention on your part, but we beg to remind you that all doubts as to the ultimate success of the enterprise have been removed, that differences are being amicably compromised and an expectant and united public now await the action of a wise and patriotic congress to put the seal of national approval on a project that has been developed by the inventive genius and skill of American engineers, demanded by American commercial interests, and which, when completed, will become the pride of the American people and a most fitting accomplishment to round out the wonderful industrial activity and commercial enterprise of the nineteenth century.

Your petitioners earnestly believe that wise action on the part of your honorable bodies, such as would guarantee the immediate construction of the Nicaragua Canal under American control, would have great effect in retrieving the industrial and commercial activities deranged by the prevailing depression, for it must be admitted that anticipation is an important factor in business enterprise and the most conservative and cautious of inventors are impelled to discount future conditions when such conditions are stimulated by the promise and the protection of the American government. We feel sure, therefore, that should the construction of the canal begin at once under the assurance of congress that our government will continue it, the benefits to be expected from its completion—the increased values, the founding of enterprises, the investments and activities—will begin at once as a result of the confidence which your action would stamp upon the public mind.

Believing that the construction of the Nicaragua Canal is the most important accomplishment to which the Fifty-third congress can devote its time, energies and wisdom during the approoching short session, and having full confidence in your zeal in behalf of our material interests and your ardor in a cause which affects the glory and prestige of the American name and the American flag, we sincerely pray you will permit no unnecessary delay to postpone consideration on this subject. Respectfully and confidently submitted,

HUMBOLDT CHAMBER OF COMMERCE AND MASS CONVENTION OF HUMBOLDT BUSINESS MEN.

WM. CARSON, President.

Adopted November 19, 1894.

ELECTRICITY ON SHIPBOARD.

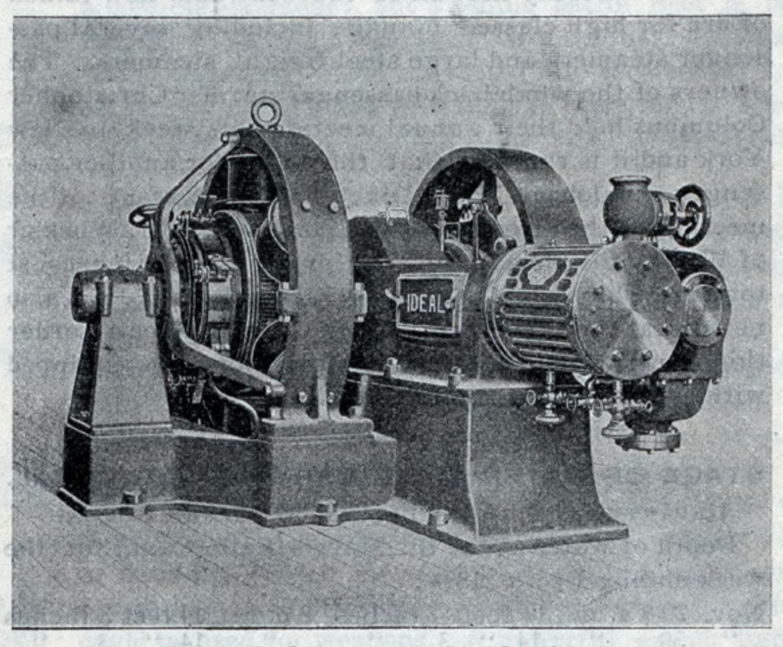
BY S. DANA GREENE, LATE ENSIGN U. S. NAVY.

A paper read before the Society of Naval Architects at their second annual meeting in New York last month on "Electricity on Shipboard," is one of the most valuable contributions to the field of practical applications of electricity which has ever been given the public. Mr. Greene is now we believe with the General Electric Co., New York.

The author, S. Dana Greene, late ensign U. S. Navy, pointed out the rapid march which has been made during the past decade in the development of electricity on shipboard, and says that this agency has become recognized and standardized so that it can be relied upon for continual and active service. As a result there have been developed for marine work a special type of generating set (engine and dynamo) special appliances (switches, junction boxes, cut-outs, stuffing tubes, watertight globes and lanterns, etc.,) special insulation for conductors, special methods of wiring, special forms of search lights, and special men who may properly be called "Marine Electricians." These apparatus and appliances differ materially from those in use on shore, and must be used under service conditions entirely dissimilar. Salt water, salt air, steam and the excessive heat of ship boiler and engine rooms, would play havoc in a very short time with the best modern shore installation, as they have, in fact, with many of the early ship plants, and if there is any place in the engineering world where the old axiom of "penny wise and pound foolish" should be stamped in large letters, it is on the plans of an electric marine plant.

The uses to which electricity is now put on board ship are numerous and in naval vessels it has become an absolute necessity, while in freight and passenger steamers and high classed yachts it is also universally applied. Aside from the many mechanical uses, electricity as applied in navigational features has become invaluable prominently so when turned into the search light, electric logs, the electric steering compass, means of communication between the various officers and parts of large vessels, signalling and firing circuits as well as being used as a range or position finder.

Relative to the electric log Ensign Greene points out that the French navy has recently adopled one, the invention of Rear Admiral Fleuriais. A set of revolving vanes on the log impart, through worm gearing, motion



SOUND STEAMER PRISCILLA.
ONE OF THREE MARINE UNITS. 67 HP. EACH.

to an ivory disc mounted in the log, and a spring makes contact with metallic plates placed at intervals on the rim of this disc. As this contact takes place, a bell is sounded aboard ship, once for every 24 revolutions of the vanes. The interval between signals is arranged 11 seconds for 8 knots, 8.8 seconds for 10 knots, 4.4 seconds for 20 knots, and is, therefore, of sufficisnt length to prevent error. To indicate fractions of a second, the usual sand glass has been displaced by a pendulum indicator which beats at intervals of two-tenths of a second and which is started at the moment of taking an observation. A mistake of half a second, with a period of 50 seconds, makes an error of only one-tenth of a knot in the speed of the vessel; if the observation is prolonged. the error is reduced. The apparatus is simple and apparenlly gives good satisfaction. The log is about 9¾" in diameter and is not watertight.

Another French invention, by Lieut. Bersier, French Navy, which will probably be introduced aboard ship, is the steering compass. Its object is to keep a ship on her course automatically and without the constant manipulation of the wheel in the hands of the helmsman. The following brief description of the device is taken from a recent technical journal. The electric spark of a Ruhmkorff coil is made to unite a pointer on the circumference of the compass card with either one of two semi cylindrical, metallic plates, which are electrically insulated from each other and from the side of the compass box or binnacle. The coil is placed a few yards from the compass and is supplied by an alternating current of from two to three amperes. The induced current of the secondary coil reaches the pivot of the compass, through a flexible wire, and passes thence to the aluminum capsule that carries the sapphire, and follows along an aluminum wire or pointer which forms a radius of the north pole of the compass. As the ship deviates to the right or left of her course, the current leaps (through a distance of about an inch) from the pointer to the right or left hands insulated plate in the binnacle, and thence flows through one of two electro magnets, which, in turn, close the circuit, in one direction of rotation or the other, of a small 150-watt motor. The shaft of this motar is keyed to the shaft of the rudder motar, which moves the rudder in the direction required to bring the ship back to her course. It is reported that the compass card is entirely uninjured by the current or spark, and that the device has been tested in squadron practice for two months with complete success.

DREDGING CONTRACTORS ON THE LAKES.

The water surface of the Great Lakes with the land draining into it presents a total drainage basin of over 270,000 squire miles. The area of water surface in square miles is as follows: Lake Superior, 31,200; St. Mary's River, 150,000; Lake Michigan, 22,450; Lake Huron and Georgian Bay, 23,800; St. Clair's River and Lake St. Clair, 435; Detroit River, 25; Lake Erie, 9,960; Niagaria River, 15; Lake Ontario, 7,240, making a total of 95,275 square miles of water surface. The length of the shore line of the lakes and their connecting rivers is about 5,400 miles. If the average discharge of the lakes passed through a river one mile wide with a mean velocity of one mile per hour, such a river would have a dapth of 40 feet from shore to shore.

It is well known that the United States Supreme Court has held the Great Lakes to be high seas, legally and commercially. They are protected under the same laws that apply to the coast line and oceans. Furthermore during the past century there has been expended on the lakes out of the yearly river and harbor appropriation nearly $40,000,000 and the twenty and twenty-one foot project now under way is the greatest work ever attempted on fresh water from a commercial or financial standpoint.

It is not to be wondered, therefore, that such important waterways, their conservancy and improvements should have called into being an important industry as evidenced by the large capital invested in plants and appliances for pier, wharf, dock and jetty building, dredging, as well as submarine work of all descriptions.

To carry out these public and private enterprises the following list of firms are among the most prominent on the lakes:

L. P. & J. A. Smith	Cleveland, Ohio.
C. H. Strong & Son	" "
McGrath & Anderson	Green Bay, Wis.
Wisconsin Dredge & Dock Co	Manitowoc, Wis.
W. A. McGillis	South Chicago, Ill.
American Hydraulic Dredging Co	" "
Chicago Dredging Co	" "
McMahon & Montgomery Dredging Co	" "
Green Dredging Co	" "
Fitzsimmons & Connell Co	" "
The Dodge Dredging Co	" "
McGillis & Low	" "
Hingston & Woods	Buffalo, N. Y.
John Hickler	" "
Dunbar & Son	" "
Dunbar & Sullivan	" "
Hingston, Wood & Rodgers	" "
Sadler & Allen	Detroit, Mich.
R. J. Cram, No. 32 Adams Ave	" "
A. J. Dupuis	" "
Geo. Lockerby	" "
William May	" "
Detroit Dredging Co	" "
James Rooney	Toledo, O.
J. C. & J. H. Davis	" "
G. H. Breymann & Bros	" "
C. S. Barker	Duluth, Minn.
Williams, Daugherty & Upham	" "
C. E. Mitchell & Co	Ludington, Mich.
Harvey Hubbell	" "
Saginaw Dredging Co	Saginaw, Mich.
Carkin, Stickney & Cram	East Saginaw, Mich.
James Daly	Ogdensburg, N.Y.
Lynch & Hannan	" "
John Stang	Lorain, O.
Quartus Gillmore	" "
Sheboygan Dredge & Dock Co	Sheboygan, Wis.
Racine Dredge Co	Racine, Wis.
McCollum & Lee	Essexville, Bay Co., Mich.
Hickler Bros	Sault Ste. Marie, Mich.
C. H. Starkey	Milwaukee, Wis.
D. N. Runnels	Port Huron, Mich.
Kirby, Carpenter & Co	Menominee, Mich.

The foregoing list of names while being in the main dredging contractors of repute are also engaged in taking up extensive government contracts for building breakwaters, pile driving, constructing piers, etc., while not a few are capable dry dock builders, owners of large fleets of tugs and repairers as well as builders of their own craft or such tonnage as is suitable to their special work.

MARINE LEGISLATION.

"I'm sorry Bill got beat," said the constituent. "That there bill he was intending to get passed will never git through, I suppose."

"What was it?" asked the other constituent.

"W'y, you know what is called a derelict—one of them abandoned ships that is sich a danger of navigation?"

"Yes."

"Well, Bill he allowed to git a bill through requirin' them all to carry red lights at night. It would 'a' been a big thing fer navigation, and fer Bill, too."—*From the Indianapolis Journal.*

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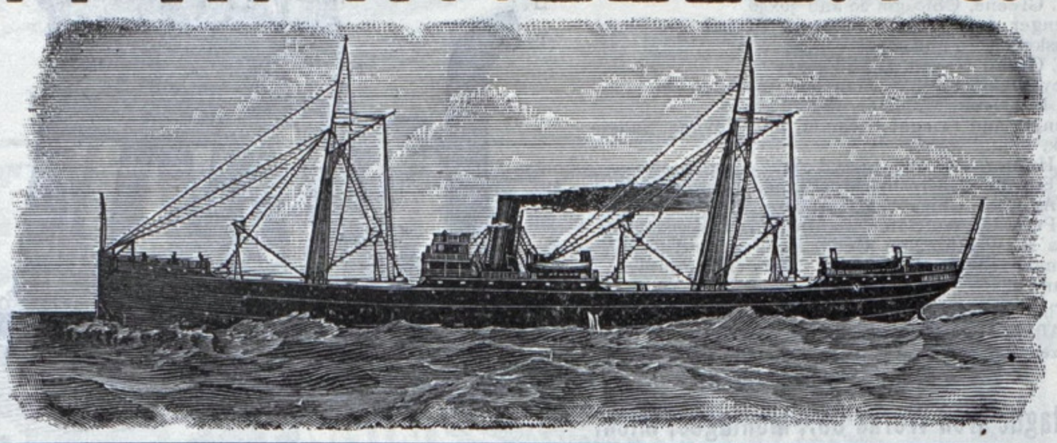

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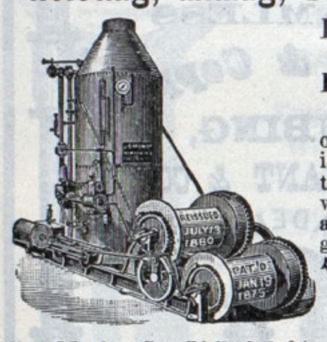

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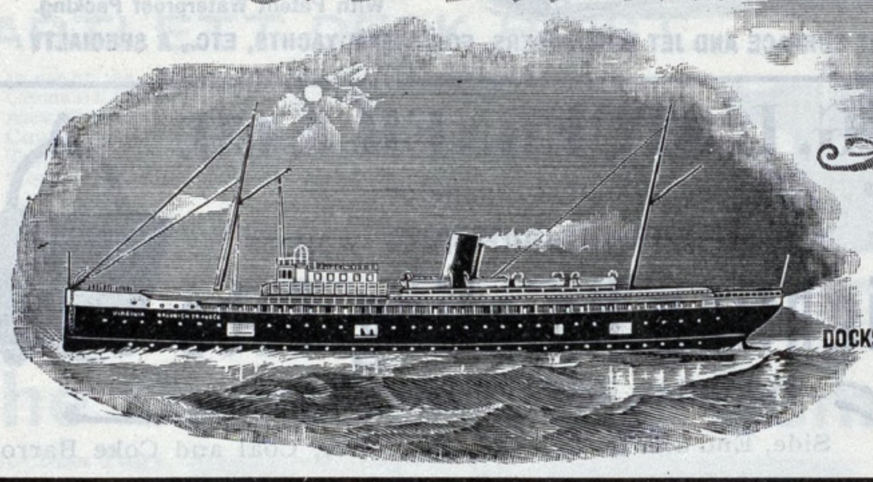

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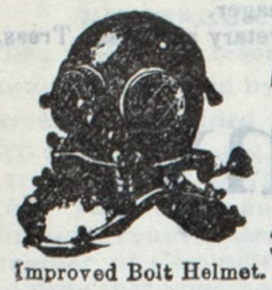

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U. S. ENGINEER OFFICE, 601 Eighteenth Street, N. W., Washington, D. C., November 28, 1894. Sealed proposals for the construction of a sewerage system at Fort Monroe, Va., will be received here until 12 m., Saturday, December 29, 1894, and then publicly opened. All information furnished on application. CHAS. E. L. B. DAVIS, Major, Engineers. 49-52

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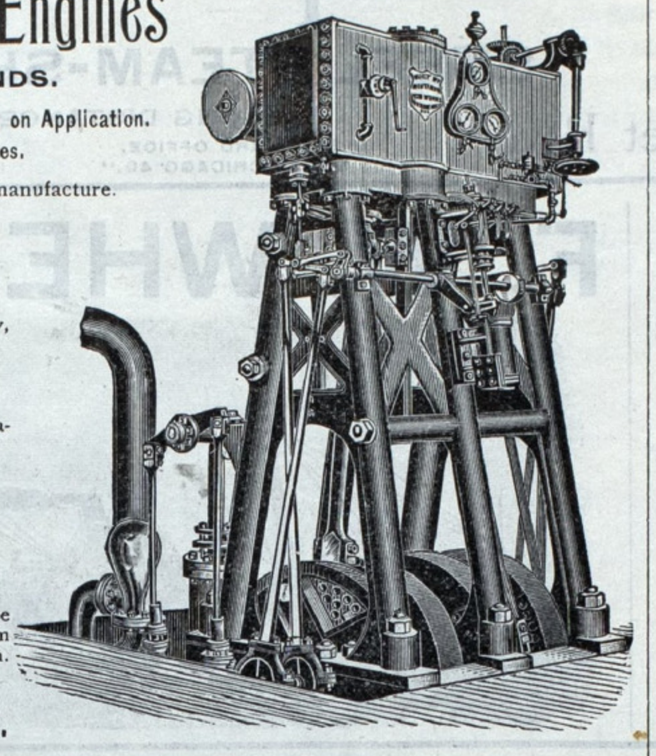

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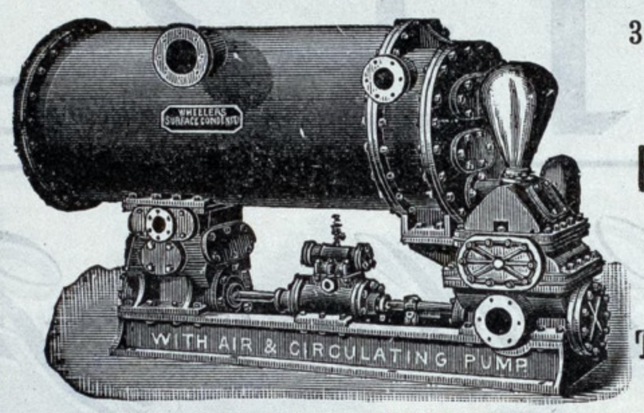

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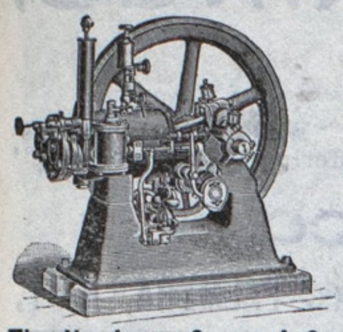

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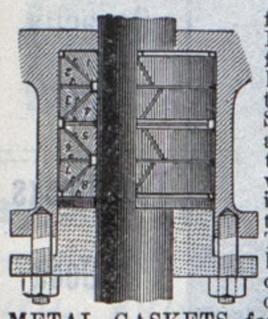

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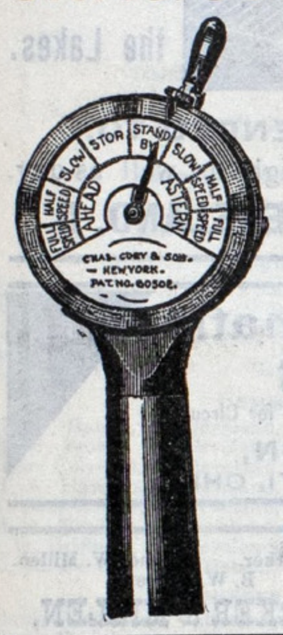

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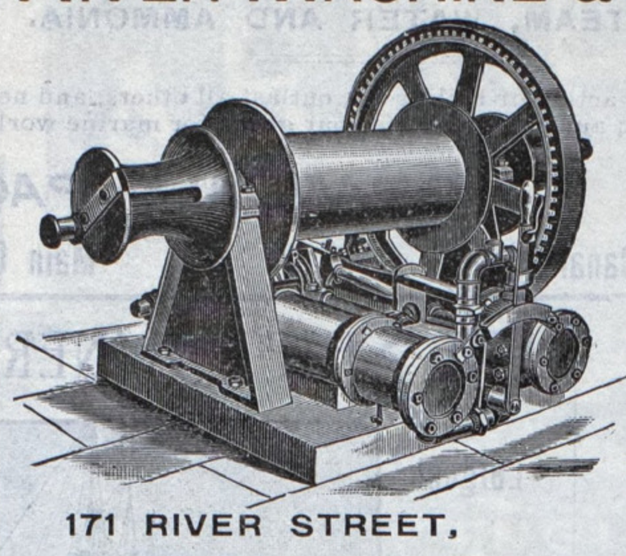

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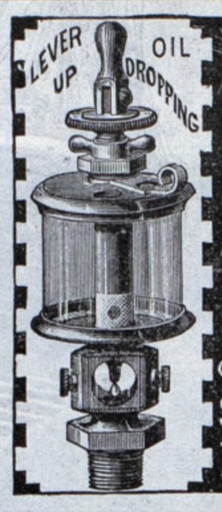

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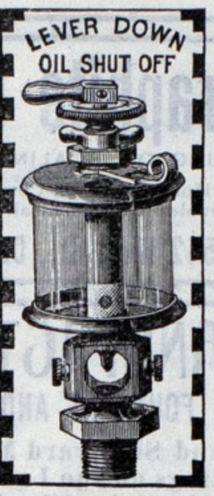

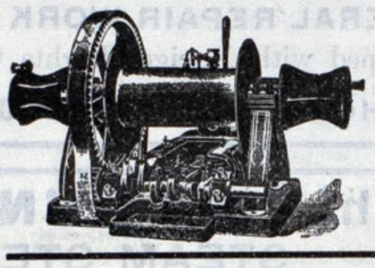

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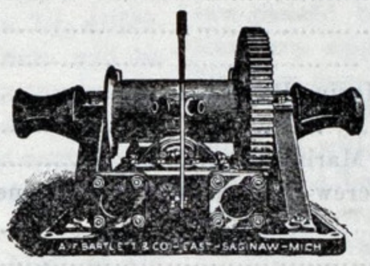

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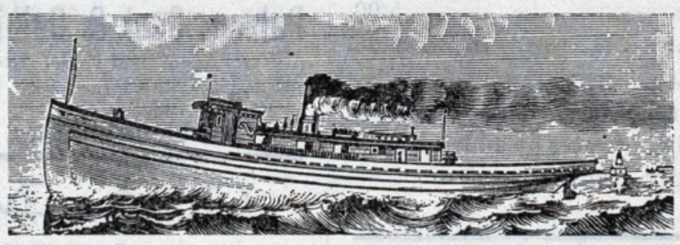

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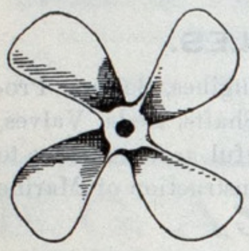

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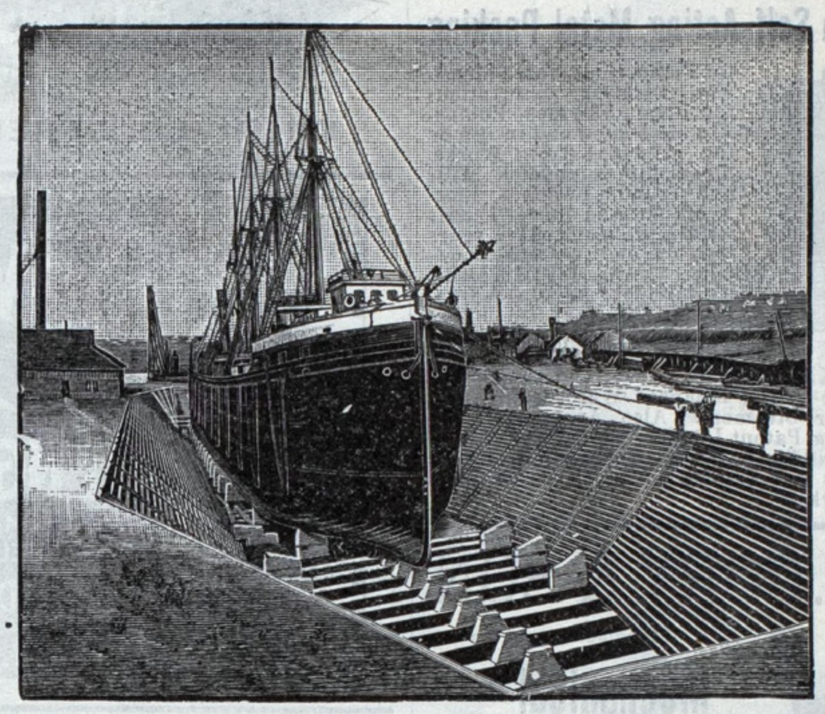

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